

Good Morning Welcome to the NextGen “All Hands”



NextGen Update

JPDO All Hands Meeting

July 27, 2007

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Director,
Joint Planning and
Development Office



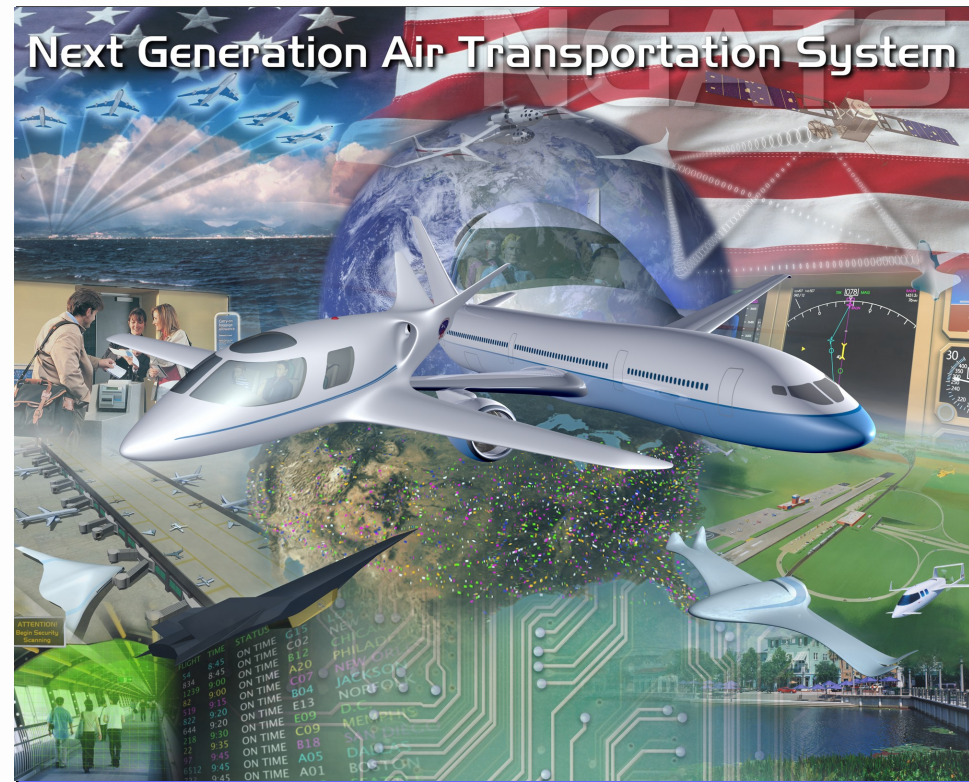
2025 NextGen Principles and Concepts

Operating Principles

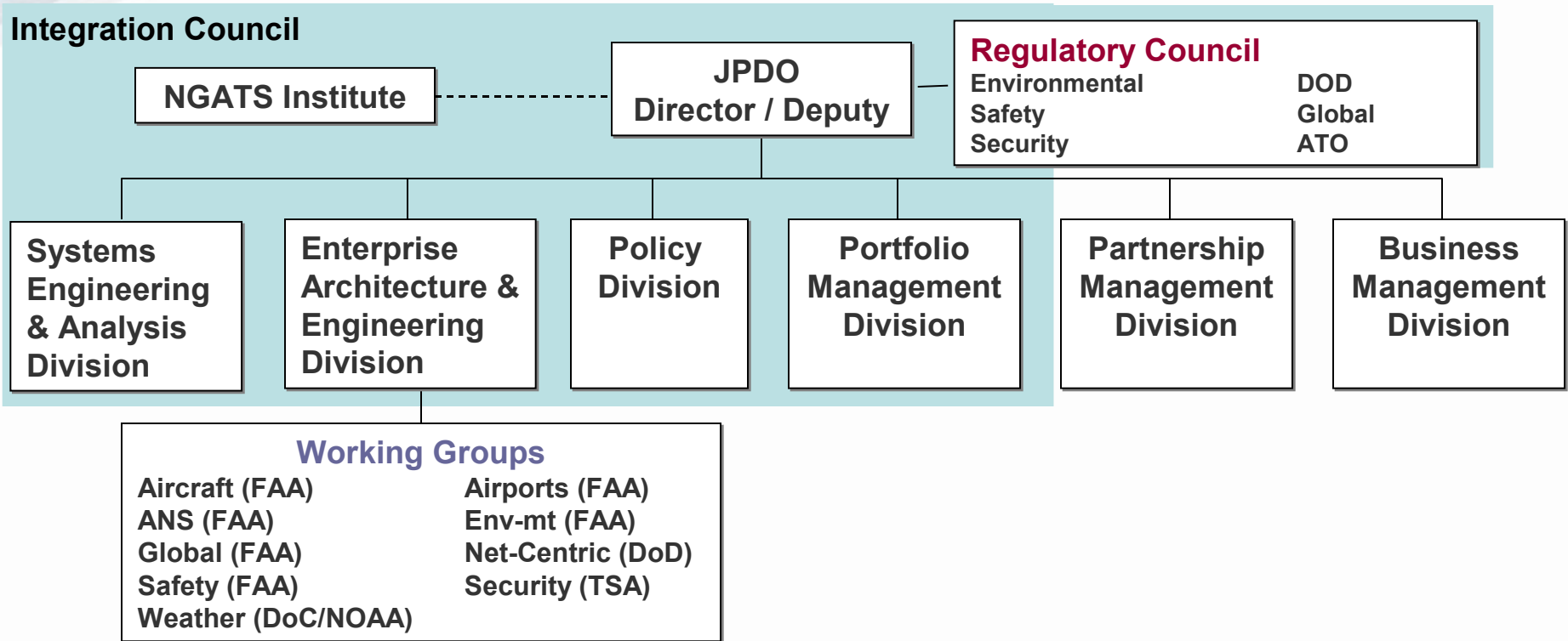
- User-focused
- System-wide transformation
- Prognostic approach to safety
- Globally harmonized
- Environmentally compatible

Key Capabilities

- Net-Enabled Information Access
- Performance-Based Services
- Weather-Assimilated Decision Making
- Layered, Adaptive Security
- Position, Navigation, and Timing Services
- Trajectory-Based Aircraft Operations
- “Equivalent Visual” Operations
- “Super Density” Operations



Top-Level JPDO Organization



Governance

- Senior Policy Committee
- Board of Directors

Advisors

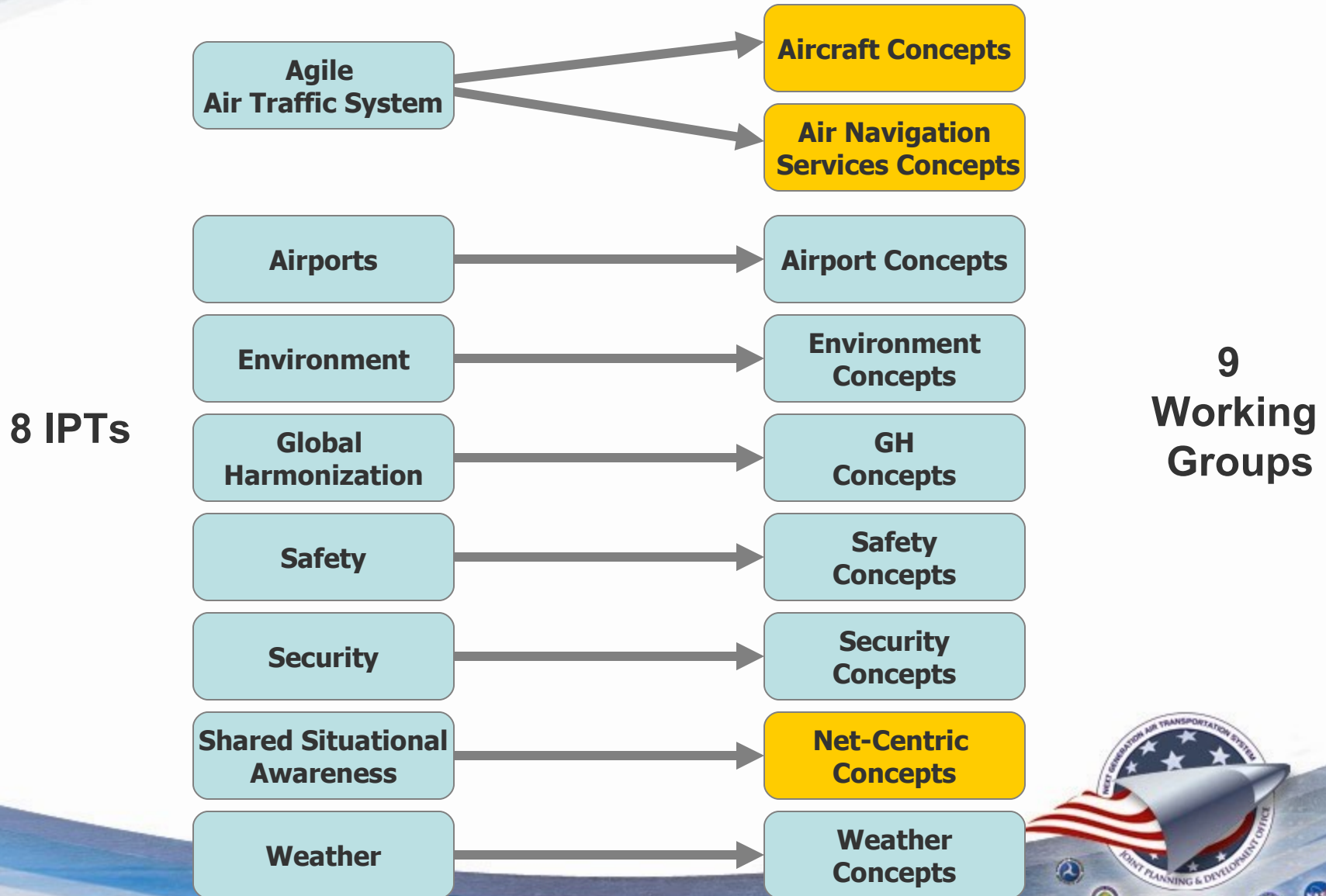
- REDAC Executive Committee
- Institute Management Council

Inter-Agency Coordination

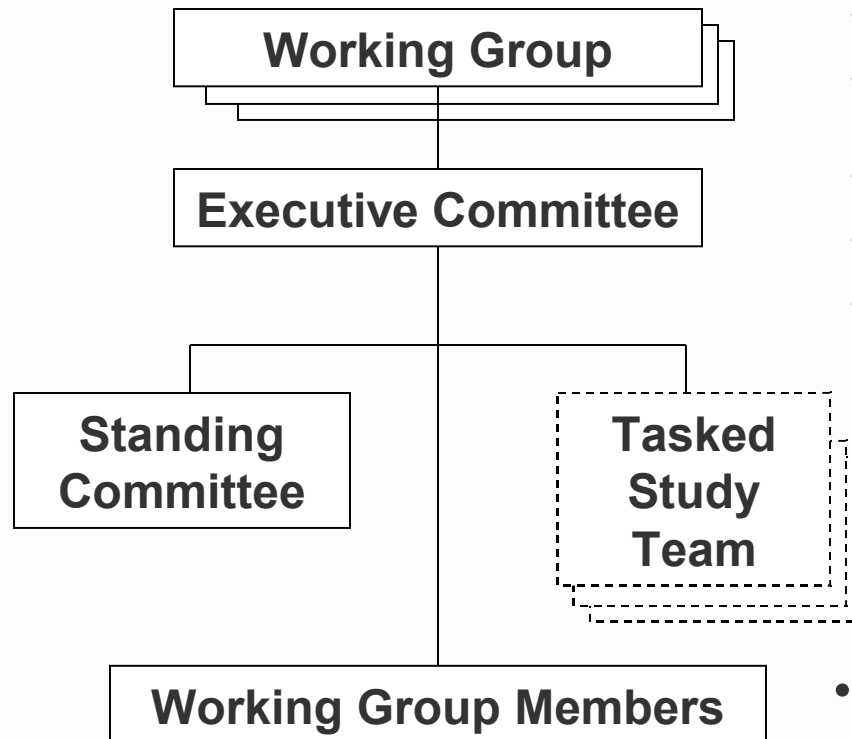
- Joint Architecture & Engineering Board



Operational Concepts Working Group Overview



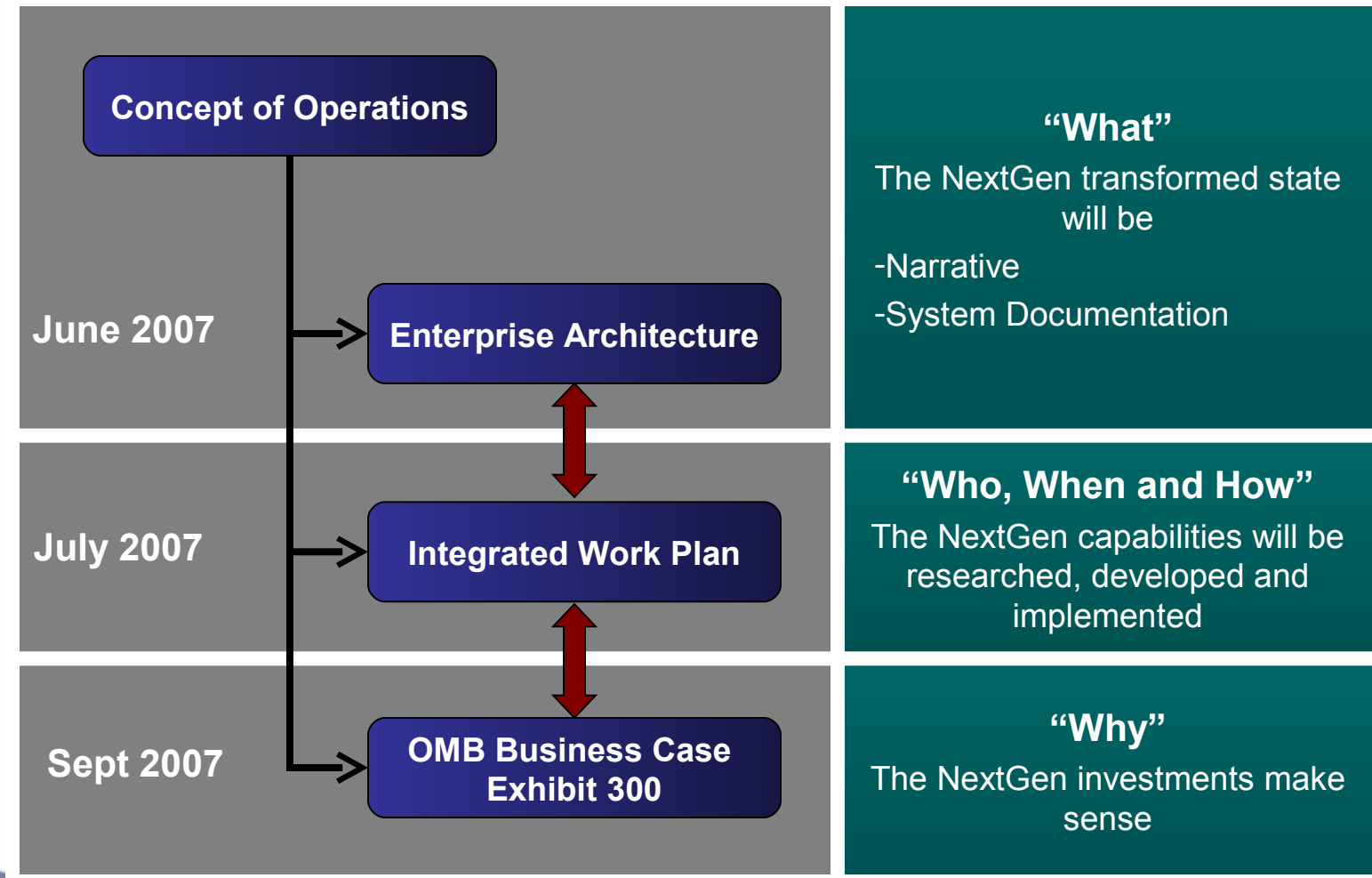
Working Group Structure



- Industry/government co-leads
- Committed at least 25%
- 6-8 members
- Committed at least 20%
- Reviews study team results
 - Task focused
 - Product delivery schedules
 - Disband upon completion
- Provide volunteers for study team activities



NextGen Plan



ATM "View" of Evolution

Research

Building NextGen

FY07 – 11

4DT Management
Performance-Based Ops &
Services
Equivalent Visual Ops
(CDTI)
Roles of Pilots & Controllers

Core Technologies, Capabilities & Sys Eng

Epoch 1 FY07-11

- Complete R&D leading to mid-term
- Continue R&D that address long-term NextGen challenges
- Develop & implement known & new procedures, infrastructure, technologies
- Develop NextGen systems integration plan for mid-term transition to NextGen
- Complete infrastructure and systems engineering for mid-term

FY12 – 18

Super Density Operations
Time-Based Surface Ops
Right Sizing of Facilities

Mid-Term Transition to NextGen

Epoch 2 FY12-18

- Aircraft equipped for the mid-term & upgradeable to NextGen target
- Deliver NextGen services & capabilities across domains
- Complete "hard" infrastructure – airports, runways, terminals, security
- Management & operating models support transition to NextGen and long-term sustainability

FY19 – 25

Research for Evolving
NextGen State

NextGen Solutions Fully Integrated & Operating

Epoch 3 FY19-25

- NextGen solutions fully-integrated & operating across air transportation system
- Services managed & operating in ways that achieve transformational outcomes across air transportation system

Implementation Approaches

- FAA – Operational Evolution Partnership (OEP)
- DoD – NextGen Program Office
 - Inter-agency Weather Study Team
 - Network-Enabled Operations
- DoC – Inter-agency Weather Study Team
- DHS – TBD
- NASA – Aeronautics Research Plan



NextGen Implementation Status

Funded Commitments

FY07

ADS-B - Implement 1st segment of advanced surveillance & broadcast services to deliver en-route, terminal, & surface surveillance data from key sites via broadcast comm. link

FY08

SWIM - Implement 1st set of data exchange services using net-centric technology and architecture to support increased shared situational awareness

NNEW – Demonstrate inter-agency Wx Dissemination Mgmt capabilities to Integrate effective Wx info into Operational decision-making

DataComm – Develop architecture to transform from a voice-only comm. to an air-ground data comm. capability

Demos & Infrastructure - Perform formal demos that advance R&D, operational concepts and key infrastructure

FY09

Mid-Term Capabilities

2012 - 2018

- Initiate Trajectory-based Operations
- Increase Arrivals/Departures at High Density Airports
- Increase Flexibility in the Terminal Environment
- Improve Collaborative ATM
- Reduce Weather Impact
- Increase Safety, Security, and Environmental Performance
- Transform Facilities

NASA programs

- Aviation Safety
- Airspace Systems
- Fundamental Aeronautics

2019-2025

Senior Policy Committee

Agreed to support:

- Development of the NextGen National Information Sharing Framework
 - DoD lead
 - Proposed Governance and Oversight Structure will be presented at the next SPC meeting
- Development of Safety Management System Standard
 - Aviation Safety Information Analysis and Sharing
 - Multi-agency governance and accountability
- Joint Weather Study Team – By January 1, 2008
 - Common functional 4D Weather Cube requirements
 - Evolve baseline requirements
 - Refine cost-benefit analysis



The Cost of NextGen

- JPDO has reviewed several initial outside estimates:
 - FAA's Research, Engineering and Development Advisory Committee (REDAC)
 - MITRE Avionics Estimate
 - FAA's Air Traffic Organization (ATO)
- The first five years - \$4.6 billion:
 - \$4.3 billion in ATO capital appropriation
 - \$300 million in research, engineering and development



The Cost Of NextGen (cont'd)

- Longer-Term Cost Estimates:
 - Next 10 years \$8-10 billion
 - End-state or through 2025 \$15-22 billion
- Avionics costs = \$14-20 billion



Benefits of End-State NextGen

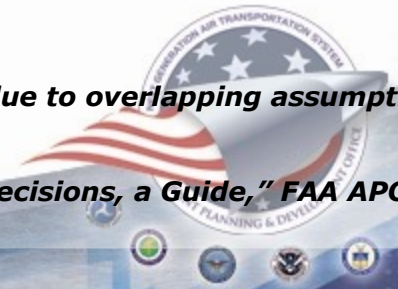
Phase of Flight	Flight Situation	Flight Time Reduction	Total Dollar Savings per Year	Portion of Savings Due To Fuel
Surface-Taxi out and Taxi-in	Small Airports	30 seconds	\$328 million	\$79 million
	Large Airports	2 minutes	\$1.3 billion	\$315 million
Terminal area, including departure, landing	Small Airports, Good Wx	10 minutes	\$6.5 billion	\$1.6 billion
	Large Airports, Bad Wx	30 minutes	\$19.7 billion	\$4.7 billion
Enroute (cruise phase)	Good Weather	10 minutes	\$6.5 billion	\$1.6 billion
	Severe Weather	20 minutes	\$13.1 billion	\$3.1 billion

Based upon FAA estimates of \$2,736/hour of airline direct operating costs, includes variable (fuel is assumed to cost \$722/hour) and fixed costs (such as depreciation), and \$1,090/hour of general aviation direct operating costs (GA fuel is assumed to cost \$114/hour).

Assumes 36,000 airline flights/day, 16,000 general aviation IFR flights/day.

Assumes all flights accrue the benefits. Benefits across flight phases are not additive due to overlapping assumptions and correlation.

Source of cost data: GRA Inc., "Economic Values for FAA Investment and Regulatory Decisions, a Guide," FAA APO, December 2004.



Recent Activities

- **Congressional**

- U.S. Senate Subcommittee on Aviation Operations, Safety, and Security – Professional Staff Briefing, April 5
- U.S. House Committee on Transportation and Infrastructure, Subcommittee on Aviation – Hearing on the Future of Air Traffic Control Modernization, May 9
- NextGen Day on the Hill (House), June 13
- NextGen Day on the Hill (Senate), July 11



Recent Activities (cont'd)

- **Governance**

- JPDO Board Meetings (2), May 23 and June 8
- SPC Meeting, June 25
- FAA Management Advisory Council, July 20

- **Coordination**

- NextGen Steering Group Meeting with CAAC/ATMB, April 14–19
- NASA Day, May 16
- CIO Information Sharing Summit, May 24
- Integration Council Meetings (2), May 18 and June 20
- Electronic Systems Center Staff Visit, June 26
- Weather Day: Industry and Government, June 27
- Information Sharing Environment, July 17



Recent Activities (cont'd)

- **Presentations**

- Aviation 2007: Ready to Takeoff – U.S. Chamber of Commerce Event, April 4
- NASA National Advisory Council (NAC) meeting, Kennedy Space Center, April 17 – 18
- NEO Demonstration to Secretary Peters, May 1
- REDAC, May 2
- Cross Border Aviation Summit, Juneau, Alaska, May 29 – 31
- Flight Explorer Users' Conference, June 5 – 6
- MITRE Aviation Advisory Committee, June 8
- Inter-agency Surveillance Summit, Colorado Springs, June 20
- NGATS Institute Annual Public Meeting, June 21
- Aeronautics and Space Engineering Board, June 22
- FAA/EUROCONTROL ACTION PLAN 2 Technical Interchange Meeting, June 22 – 28
- DOD Policy Board on Federal Aviation, July 9



Potential 2008 JPDO Workplan

- Synchronize JPDO products with each other and the Federal budget cycle
- Achieve multi-agency alignment with NextGen plans
- Target high leverage activities and investments
- Define metrics to assess NextGen progress
- Establish a NextGen simulation-based decision support environment



Thank you.

Comments / Questions



BACKUP



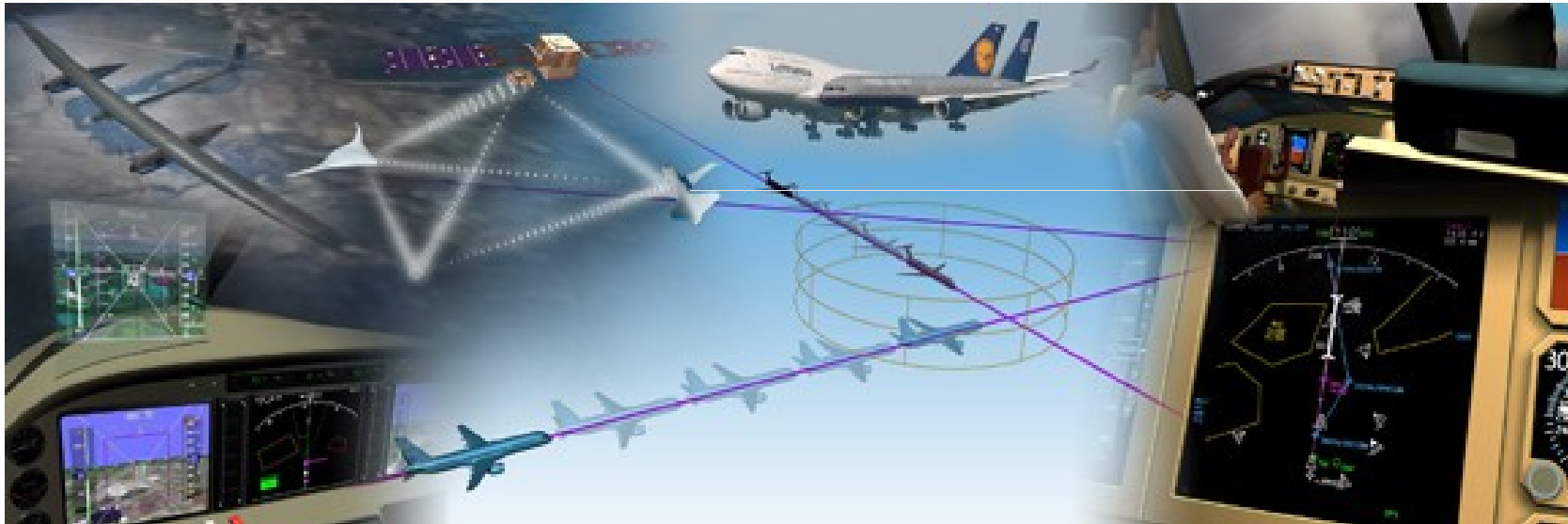
Key Capabilities: Network Enabled Information Access



- Network Enabled Operations (NEO)
- Network Enabled Infrastructure (NEI)
- Network Enabled Weather (NNEW)



Key Capabilities: Performance-Based Operations and Services



- Collaborative ATM
- Modernized Surface Ops.
- Weather Impacted Ops.
- Trajectory-based Ops.
- Trajectory-based Separation Management
- Dynamic Resource & Aerospace Management



Key Capabilities: Weather Assimilated into Decision-Making



- Net-centric weather information is made available and understandable to all approved users
- A reliable virtual, common weather picture is foundational for optimal air transportation decision-making
- Presentation of weather data is tailored to user operational needs
- Widespread use of integrated probabilistic weather-related decision support systems
- Automatic updates to users based on operational need
- An adaptive observing system integrating ground, airborne and spaced-based sensors



Key Capabilities: Layered Adaptive Security



- Adaptive Security for People, Cargo, Airports and Aircraft
- Risk Assessment-Driven Evaluation and Response
- Positive Identification for People and Cargo
- Preventive Threat Detection and Mitigation



Key Capabilities: Position, Navigation and Timing Services (PNT)

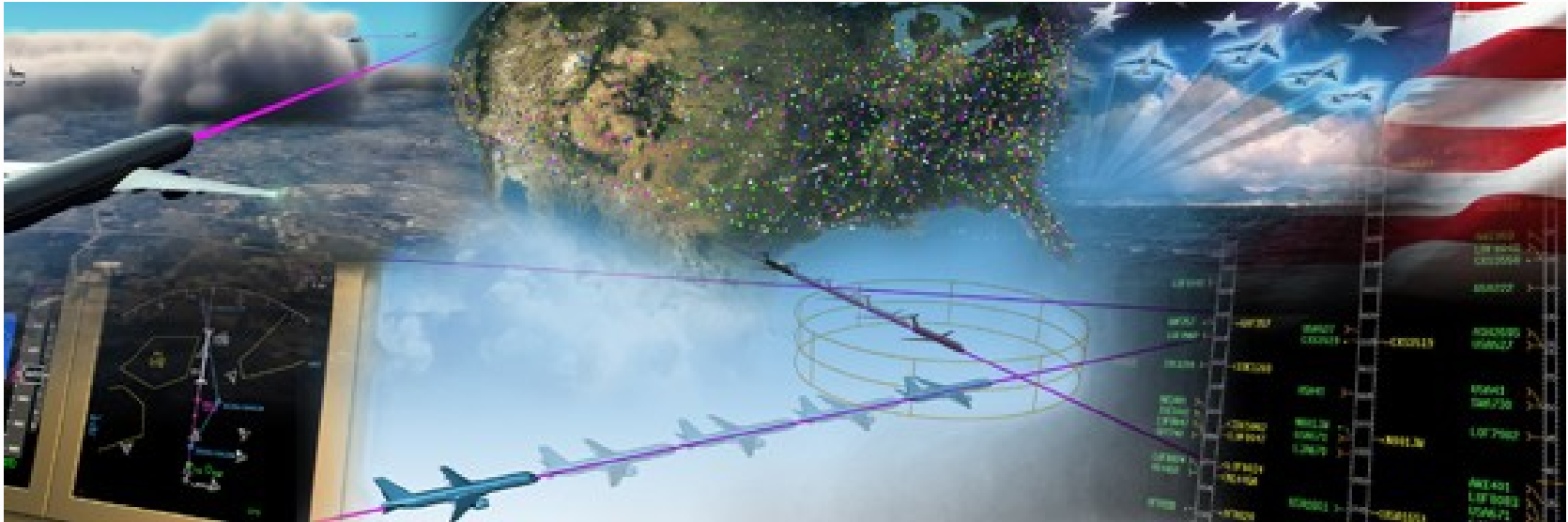


- Air routes are independent of the location of ground-based navigation aids
- RNAV is used everywhere; RNP is used where required
- System performance meets operational needs to service the demand
- Increased availability of guided approaches at smaller airports*

*Mostly for general aviation with lower minimums



Key Capabilities: Aircraft Trajectory-Based Operations



Services and Operations based on precise trajectory execution

- Self-Separation Services
- Flow Corridors
- Super Density Arrival/Departure Airspace



Key Capabilities: Equivalent Visual Operations



- Improved information availability which allows aircraft operations without regard to visibility
- Access to PNT enables increased accessibility for airport surface and arrival/departure operations
- Enables more predictable and efficient operations regardless of meteorological conditions



Key Capabilities: Super Density Operations



- Use of RNP operations and procedures
- Mitigation of wake vortex constraints
- Improved runway incursion prevention algorithms
- Automatic distribution of runway braking action reports
- Distribution of taxi instructions before landing
- Use of aircraft sensors

